

**UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

UNITED STATES OF AMERICA,

Plaintiff,

v.

DONALD LEE, ET AL,

Defendants.

No. 19 C 641

Judge Thomas M. Durkin

MEMORANDUM OPINION AND ORDER

Defendants Donald Lee and Torance Benson filed a motion to exclude expert testimony regarding firearm toolmark analysis. R. 553. For the reasons that follow, that motion is denied.

Background

The defendants are charged with conspiring to engage in a variety of racketeering acts through an enterprise known as the Wicked Town faction of the Traveling Vice Lords street gang, in violation of 18 U.S.C. § 1962(d). Discovery has included numerous Illinois State Police lab reports which purport to analyze firearms, bullets, cartridge casings, and other firearm-related evidence. As part of its case in chief, the government intends to call some of the Illinois State Police analysts who examined the firearms and shell casings as experts in the field of firearm toolmark analysis. The defendants moved to exclude that testimony under Federal Rule of Criminal Procedure 702.

Legal Standard

Rule 702 governs expert testimony. A person may testify as an expert under Rule 702 if: (1) their testimony will “help the trier of fact to understand the evidence or to determine a fact in issue”; (2) their testimony is “based on sufficient facts or data”; (3) their testimony is “the product of reliable principles and methods”; and (4) they have “reliably applied the principles and methods to the facts of the case.” Fed. R. Crim. P. 702. District courts must apply Rule 702 by acting as “gatekeepers” to prevent irrelevant or unreliable testimony from being admitted. *See Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 597 (1993); *Lapsley v. Xtek, Inc.*, 689 F.3d 802, 809 (7th Cir. 2012). This gatekeeper function applies to all expert testimony, not just testimony based in science. *See Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 147-48 (1999). In performing its gatekeeping function, a court’s primary concern is with “the validity of the methodology employed by an expert.” *Manpower, Inc. v. Ins. Co. of Pa.*, 732 F.3d 796, 806 (7th Cir. 2013). By contrast, the “soundness of the factual underpinnings of the expert’s analysis” is “to be determined by the trier of fact.” *Smith v. Ford Motor Co.*, 215 F.3d 713, 718 (7th Cir. 2000). “Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.” *Daubert*, 509 U.S. at 596.

In determining the reliability of expert testimony, a court considers: (1) whether a method can or has been tested; (2) the known or potential rate of error; (3) whether the methods have been subject to peer review; (4) whether there are

standards controlling the technique's operation; and (5) the general acceptance of the method within the relevant community. *Id.* at 593-94.

Analysis

Defendants argue the methodology of firearm toolmark analysis is unreliable and therefore expert testimony in the area is inadmissible.

I. Firearm Toolmark Analysis

Toolmark identification is based on the theory that “tools used in the manufacture of a firearm leave distinct marks on various firearm components,” including bullets and cartridge casings. *United States v. Otero*, 849 F. Supp. 2d 425, 427 (D.N.J. 2012), *aff'd*, 557 F. App'x 146 (3d Cir. 2014). Thus, when a shot is fired from a specific firearm, the individual markings created during the manufacture of the firearm are transferred to the ammunition. Those distinct, microscopic markings are known as toolmarks, and the general concept is that no two firearms should produce the same toolmarks on bullets and cartridge cases “such that they could be falsely identified as having been fired from the same firearm.” *United States v. Monteiro*, 407 F. Supp. 2d 351, 361 (D. Mass. 2006) (internal citations omitted).

There are three categories of toolmarks: class, subclass, and individual characteristics. *United States v. Brown*, 973 F.3d 667, 702 (7th Cir. 2020). The goal of toolmark analysis is to “distinguish between class and sub-class characteristics on one hand, and individual characteristics on the other, which ostensibly apply to the particular gun in question.” *United States v. Green*, 405 F. Supp. 2d 104, 110-11 (D. Mass. 2005). Class characteristics are resemblances present in all firearms of the

same make and model, thus producing similar marks on all ammunition from that make and model. Subclass characteristics are produced incidental to manufacture and can arise from a source which changes over time, meaning they may only be present in a certain make and model depending on the time and place of its manufacture. Individual characteristics are “random imperfections produced during manufacture or caused by accidental damage,” which are purportedly unique to that object and distinguish it from all others. *Monteiro*, 407 F. Supp. 2d at 360.

The Association of Firearms and Toolmark Examiners (“AFTE”) is the international professional organization for practitioners of firearm and toolmark identification. The “AFTE theory” is a theory of toolmark identification adopted by the AFTE, and provides that “an examiner comparing two pieces of ballistics may reach one of four conclusions: (1) identification, meaning the pieces of evidence come from the same source; (2) elimination, meaning that they came from different sources; (3) inconclusive, meaning that there is not enough evidence for an examiner to make a determination; and (4) unsuitable, which means that the recovered evidence lacks discernable class and individual characteristics.” *United States v. Shipp*, 422 F. Supp. 3d 762, 771 (E.D.N.Y. 2019) (internal citations omitted). An identification is made when the individual characteristics of the surface contours on two toolmarks are in sufficient agreement.

II. Reliability under *Daubert*

No district court has ever ruled toolmark analysis testimony is inadmissible under *Daubert*. In every case relied on by the defendants, the Court allowed the

testimony at trial subject to certain restrictions. *See, e.g., Green*, 405 F. Supp. 2d at 104 (permitting expert testimony but limiting it to the expert's observations); *United States v. Glynn*, 578 F. Supp. 2d 567 (S.D.N.Y. 2008) (considering the same report raised by defendants here, detailed below, but determining the testimony should still be admitted). The defendants argue that the methodology is nonetheless inadmissible because of concerns expressed both by courts and in the relevant literature.

The defendants are correct that toolmark analysis has been the subject of criticism. A 2008 report by the National Research Council ("NRC Report") brought into question the theory underlying firearms identification, concluding that "the validity of the fundamental assumptions of uniqueness and reproducibility of firearm-related toolmarks has not been fully demonstrated." Committee to Access the Feasibility, Accuracy, and Technical Capability of a National Ballistics Database, National Research Council, *Ballistics Imaging* (National Academies Press 2008), at 82. Similarly, a 2016 report published by the President's Council of Advisors on Science and Technology ("PCAST") casts doubt on the reliability of toolmark analysis and firearm identification. R. 553 at 9-10. Specifically, the PCAST Report found that there had only been one appropriate study of the methodology, and more were required to demonstrate validity. *Id.*

But since the issuance of the NRC and PCAST reports, courts unanimously continue to allow firearms identification testimony, finding that cross examination, as opposed to exclusion, is the appropriate remedy to counter the criticisms. The Seventh Circuit recently held that a district court did not abuse its discretion when

it admitted expert testimony on toolmark analysis. *Brown*, 973 F.3d 667. In *Brown*, the Seventh Circuit noted the defendants' arguments about toolmark analysis had "respectable grounding," and detailed both the NRC and PCAST Reports. *Id.* at 703. However, it was within the district court's discretion to choose not to give those reports dispositive effect. *Id.* at 703-04.¹

The proposed testimony in this case meets the *Daubert* standard. First, the method has been repeatedly tested. "The literature shows that the many studies demonstrating the uniqueness and reproducibility of firearms toolmarks have been conducted." *Otero*, 849 F. Supp. 2d at 432; *see also Brown*, 973 F.3d at 704 ("The AFTE method has been tested and subjected to peer review."). Second, the rate of error is relatively low. In one study, data compiled by the Collaborate Testing Service shows error rates between 0.9% and 1.5% in conclusions about whether particular casings or bullets were fired by particular guns. *R. 602* at 16; *Otero*, 849 F. Supp. 2d at 433-34; *see also Brown*, 973 F.3d at 704 ("Although the error rate of this method varies slightly from study to study, overall it is low—in the single digits—and as the district court observed, sometimes better than algorithms developed by scientists."). Moreover, the methods are subjected to peer review. Three peer-reviewed journals publish studies concerning the AFTE methods: the AFTE Journal, the Journal of Forensic Sciences, and the Journal of Forensic Identification. And the Illinois State Police Crime Lab is an accredited laboratory which has its own peer review

¹ As the government correctly points out, more studies have taken place since the publication of the NRC and PCAST Reports, alleviating in part the PCAST Report's concern that not enough studies had been conducted. *R. 602* at 12-13.

requirements in place—all findings must be photographed with notes as to the areas on which identifications are based, and findings are then peer reviewed by a separate examiner. R. 602 at 15.

Finally, as noted above, firearm and toolmark analysis remains widely accepted in the judicial system. Courts have unanimously ruled in favor of admitting this kind of evidence, sometimes limiting the scope of the testimony. Here, the government represents that its experts will testify as to their findings and conclusions regarding specific bullets and shell casings and their corresponding toolmarks. For example, Illinois State Police forensic scientist Gina Kotscharjan is expected to testify regarding three .40 caliber cartridge casings found at the scene of the attempted murder of Victim 4, allegedly committed by defendants Benson and Brown. R. 602 at 4. Kotscharjan is further expected to testify about .40 caliber cartridge casings recovered from the crime scenes of two other murders allegedly committed by Benson and Brown, and is expected to testify as to her conclusion that the casings recovered from the three crime scenes were all fired from the same firearm, based on her toolmark analysis examination. *Id.* However, the government represents that its experts (including Kotscharjan) will not testify as to a reasonable degree of scientific certainty regarding their findings.

Such testimony is consistent with toolmark analysis testimony regularly admitted by district courts and has never been excluded in its entirety during a trial. Rather, “[a]lmost all of the defendants’ contentions [are] issues that [can] be raised on cross-examination. These arguments go to the weight of the evidence, not its

admissibility. Expert testimony is still testimony, not irrefutable fact, and its ultimate persuasive power is for the jury to decide.” *Brown*, 973 F.3d at 705.

A *Daubert* hearing is not necessary. The Court has reviewed the parties’ briefs, all cases relied on by the parties as well as other judicial decisions concerning the validity of toolmark analysis, and various reports and studies on the matter. These materials provide the Court with a thorough and well-documented record from which to rule. Accordingly, the request for a hearing on the motion is denied.

Conclusion

For the foregoing reasons, the motion to exclude firearm toolmark analysis testimony, R. 553, is denied.

ENTERED:

A handwritten signature in black ink, reading "Thomas M. Durkin", is written over a horizontal line.

Honorable Thomas M. Durkin
United States District Judge

Dated: August 22, 2022